

Technical Note: No 1a	Date: 28/06/2024
Project No: t24.134	
Project: Victoria Park Christian School	
Subject: Addressing the Town of Victoria Park comments	

1. INTRODUCTION AND BACKGROUND

Based on the information provided to Transcore, it is our understanding that a Development Application (DA) has been submitted to the Town of Victoria Park (the Town) to increase the capacity of Victoria Park Christian School from 150 to 250 students.

The Town has reviewed the submitted DA documents including the Transport Impact Assessment (TIA) undertaken by Stantec (Ref: 300305052, dated 6 October 2023) and has requested further information including:

- Updated swept paths for B99 passenger cars;
- Addressing parking shortfall;
- Update trip generation and distribution of the proposed development;
- Undertake SIDRA network assessment;
- Update the crash assessment based on new crash data;
- Address pedestrian safety; and,
- Update the TIA.

However, following Transcore's liaison with the Town it was agreed that an updated TIA is not necessary, and a technical note will suffice to document the requested information.

In order to address the Town's recommendation for new traffic counts and accurately establish the trip generation and distribution of the existing school and the proposed expansion, Transcore organised manual traffic counts at the existing school crossovers on Colombo Street during the AM and PM school peak hours.

The purpose of this technical note is to document the outcome of the traffic modelling and analysis and to address the specific comments raised by the Town.

As part of the assessments Transcore also peer reviewed the Transport Impact Assessment report prepared by Stantec on 6 December 2023 (Ref: 300305052) for Victoria Park Christian School.

The location of the site is shown in **Figure 1**. A car park comprising 31 bays and serviced by two crossovers on Colombo Street is located in the south-eastern corner of the site. Currently, seven additional on-street parallel bays are located on Oswald Street with 15-minute time limits during drop off (7:30am-9am) and pick up (2:30pm-4pm) periods.



Figure 1: Location of the subject site

2. DEVELOPMENT PROPOSAL

The proposal is to amend the existing development approval (5.2020.704.1) that was initially approved by the Town on July 20, 2021. The proposed amendment is to increase the capacity of the Victoria Park Christian School from the currently limited 150 students to 250 students.

To accommodate the increased student capacity, the development proposal provides:

- An additional car park and associated circulation aisle, as shown in **Figure 2** and with more detail in **Appendix A**.
- Adding a new one-way circulation aisle through the site, connecting from Oswald Street to Colombo Street via the existing car park.
- Removing the existing car parking bays next to 10, 18, and 26 to allow for the new circulation aisle.
- Replacing the 3 removed bays with 3 new bays (29-31) shown in **Figure 2**.
- Providing 6 kiss and ride bays and 1 angled staff bay (bay 38) along the new circulation aisle.
- Incorporating 11 "stacking" bays along the one-way circulation aisle, which will provide on-site space for cars to pick up or drop off children while waiting, thereby improving the efficiency of the 6 parallel bay kiss and ride area (bays 32 to 37).

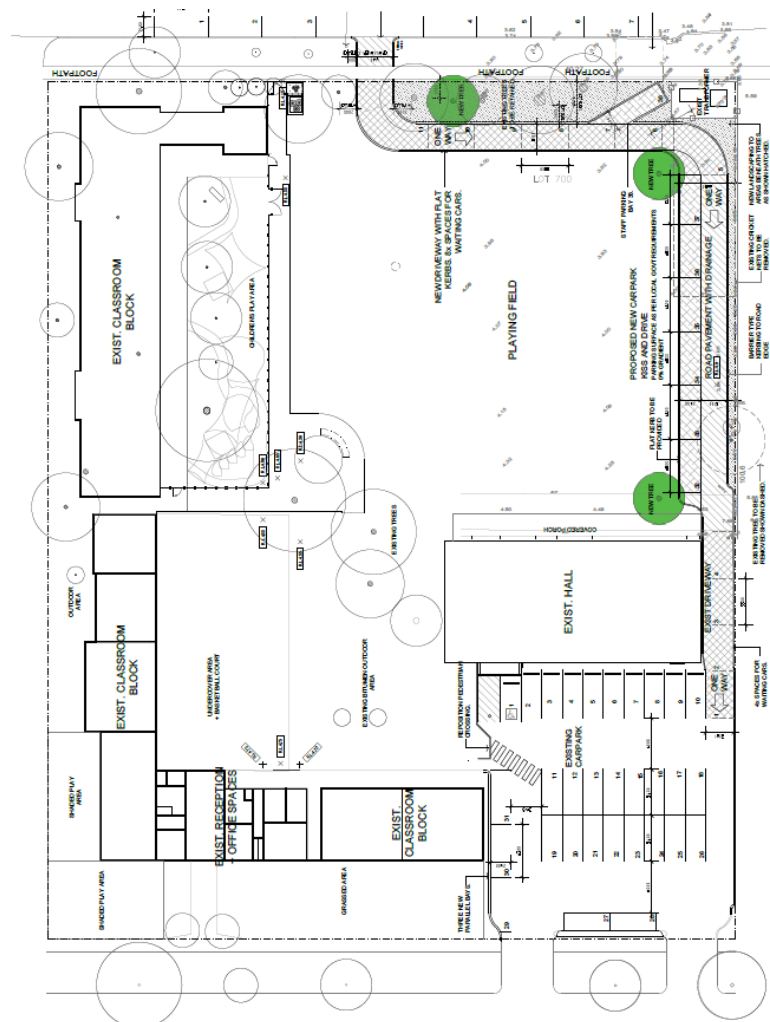


Figure 2: Proposed new carpark

3. TRIP GENERATION

Trip generation of the proposed school is calculated based on the Western Australian Planning Commission (WAPC) trip rates. Accordingly, a peak hour trip rate of 1 vehicle per hour per student (0.5 inbound and 0.5 outbound trips) has been applied to the additional 100 students as per the proposed amendment which resulted in 50vph inbound and 50vph outbound trips during the before and after school peak hours.

The overall 250 students would generate approximately 125vph inbound and 125vph outbound trips during the peak hours.

4. PARKING SUPPLY AND DEMAND

The Town of Victoria Park requires car parking for private schools to be provided at a minimum rate of 14 bays per 100 students, plus staff car parking at a rate of 0.07 bays per student or 7 bays per 100 students. Based on a maximum capacity of 250 students, the Town's parking requirement is therefore 18 bays for staff and 35 bays for students which equates to total parking demand of 53 bays.

The proposed new car park will provide a total of 38 bays on site (excluding the 11 stacking bays) which results in a 15-bay shortfall against the Town's car parking requirement ($53 - 38 = 15$).

5. ESTIMATED ACTUAL PARKING DEMAND BASED ON TRIP GENERATION

Transcore has undertaken a parking analysis based on the anticipated peak hour traffic generation of the proposed school, to estimate the anticipated number of parking bays required for drop off/pick up activities.

Section 3 of this technical note details the anticipated peak hour traffic generation of the proposed school. The calculated morning and afternoon peak hour trip generation of the proposed school after expansion is 125 vehicles inbound trips.

This represents a potential 125 vehicles using the school car park during the morning and afternoon peak hours.

The average length of stay for on-site parking bays (1-31 on the site plan) is observed to be about 5-8 minutes and mainly applies to the Pre-kindergarten/ kindergarten or lower primary (year 1 and 2) students.

The upper primary (year 3 to year 6) would be dropped off by parents and would be expected to mainly utilise the proposed additional kiss and ride parking bays (6 new car bays and 11 "stacking" bays along the one-way circulation aisle). The average length of stay for kiss and ride would be very short (around 1min)

however conservatively a 1.2min average length of stay has been assumed for the kiss and ride bays.

The existing and future enrolments for different groups of students are provided in **Table 1**. The same pattern is assumed for the future 250 enrolments. It should be noted that the 3 year and 4-year kindy students would attend the school on different days, therefore, the highest attendance at school would be relevant to the year 4 kindy students.

Table 1: Existing and future enrolments

Students	Existing enrolments	Future enrolments
3-year Kindy (T, Th)	14	23
4-year Kindy (M, W, F)	18	29
Pre-Primary	26	42
Year 1 to Year 6	96	156
Total	154	250

On this basis the actual parking requirements of for different group of students are calculated and presented in **Table 2**. Conservatively, the parking turnover is calculated for 30min window, however, in reality the pickup/ drop off will happen during 45min or 1 hour.

It is suggested that 15 bays out of the 31 on site bays (1-31 on the site plan) should be allocated to the visitors (mainly kindy and pre-primary) and the balance 16 bays should be allocated for the staff. The proposed parking provision of 38 bays, with the suggested allocation, is estimated to meet the actual parking demand of 37 bays for the future enrolment of 250 students.

Table 2: Actual parking requirements

groups	Future enrolments	parking duration	turnover in 30min	parking requirement
Kindy students (M, W, F)	29	8 min	4	8
Pre-primary	42	5 min	6	7
Year 1 - 6	156	1.2 min	25	6
Total	227			21
Staff parking				16
Total required				37
Total provided				38
Surplus				+1

It should also be noted that:

- The school provides a private bus service that picks up and drops off students. Parents pay an annual fee to reserve a space on the bus service, which incentivises them to make sure their children take the bus every day. 23% of the students use the bus service

- Some of the staff and students are expected to walk or cycle to the school. Bike parking for staff and students is provided by the school (about 7% walking and cycling is expected based on the current observations).
- Families with multiple children attending the same school will generate less traffic as these students will likely be dropped-off/picked-up by a single vehicle. Therefore, car sharing is also expected for the school (about 16% car sharing is expected based on the current observations).
- On-street parking is provided along Oswald Street on the northern school frontage (3 car bays with 4 bays to be converted for bus use). During the morning and afternoon school peaks, the parking duration for the car bays is restricted to 15 mins to encourage parking turnover.
- Parents are likely to pick up or drop off children while waiting in the stacking bays. This will shorten the pick up or drop time and will increase the parking turn over.

For the reasons outlined above, it is considered that sufficient parking has been provided to meet the anticipated need of the proposed development.

6. EXISTING TRAFFIC COUNTS

Transcore conducted manual traffic counts at the school crossovers on Colombo Street on Thursday, June 6, 2024. **Figure 3** illustrates the existing counts during the AM (08:00-09:00) and PM (15:00-16:00) peak hours. The total trips associated with the existing crossovers on Colombo Street are approximately 100 vph in the AM and 55 vph in the PM, including both inbound and outbound movements.

As evident, the trip generation of the existing car park is less than the estimated trip generation based on the WAPC guidelines. According to the WAPC trip rate of 1 vph per student, the existing 150 students would generate approximately 150 vph (inbound and outbound) trips.

The difference between the existing trip generation recorded at the school crossovers and the trip generation calculated based on the WAPC trip rates can be attributed to the following:

- The WAPC trip rates are conservative, particularly for the PM peak hours;
- Some parents may use the existing on-street bays and verges along the surrounding roads for pick-up and drop-off activities. Therefore, those trips are not captured at the existing crossovers; and,
- Not all students would generate traffic for the reasons listed in section 5.

7. TRIP DISTRIBUTION

The additional trips associated with the proposed 100 new students (as per the proposed amendment) is estimated to be approximately 50 vph inbound and 50

vph outbound during the peak hours. However, the proposed additional car park and associated circulation aisle may attract some of the existing trips that currently are using the on-street bays and verges on the surrounding roads.

It is difficult to quantify exactly how many trips would be transferred to the proposed additional car park and circulation aisle. However, in order to provide a robust assessment, the trips to the proposed additional car park and circulation aisle have been increased in a way that the total trip generation of 250 vph, as established by the trip rates suggested in the WAPC guidelines, is captured by the existing and proposed crossovers of the school site.

This approach is very conservative, as it is expected that even after the proposed modifications, some parents would still continue to use the existing on-street bays on the surrounding roads for pick-up and drop-off activities.

On this basis the maximum additional trips that would be distributed to the existing and proposed crossovers are established and presented in **Figure 4**.

8. TRAFFIC FLOWS

The post development (2025) and 10-year post development (2035) traffic projections are established by adding the existing traffic counts to the development traffic after the proposed modifications. For the future scenarios 1% annual traffic growth was applied to the background traffic. The 2025 and 2035 traffic volumes are presented in **Figure 5** and **Figure 6** respectively.

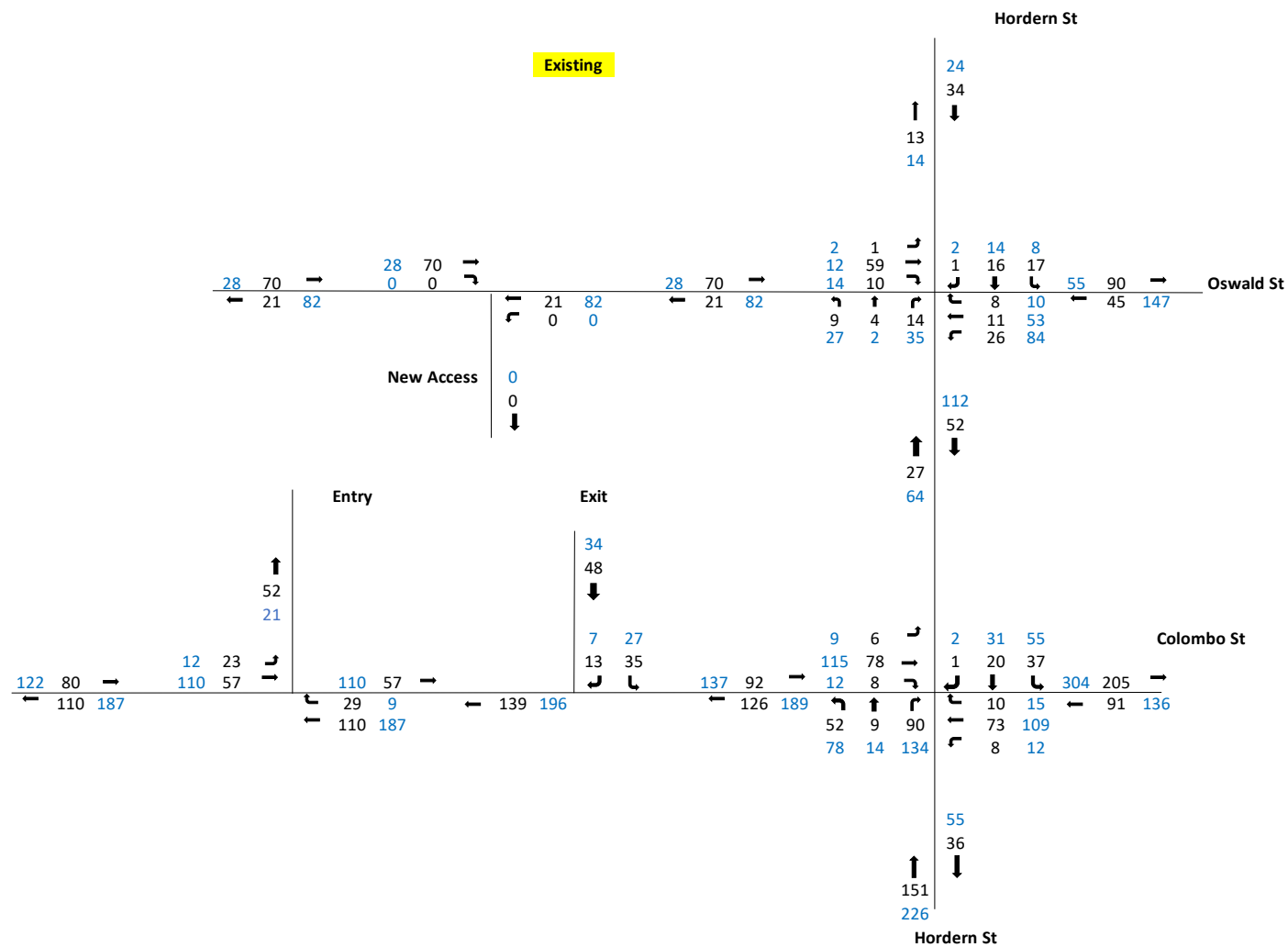


Figure 3: Existing peak hour traffic (AM/ PM)

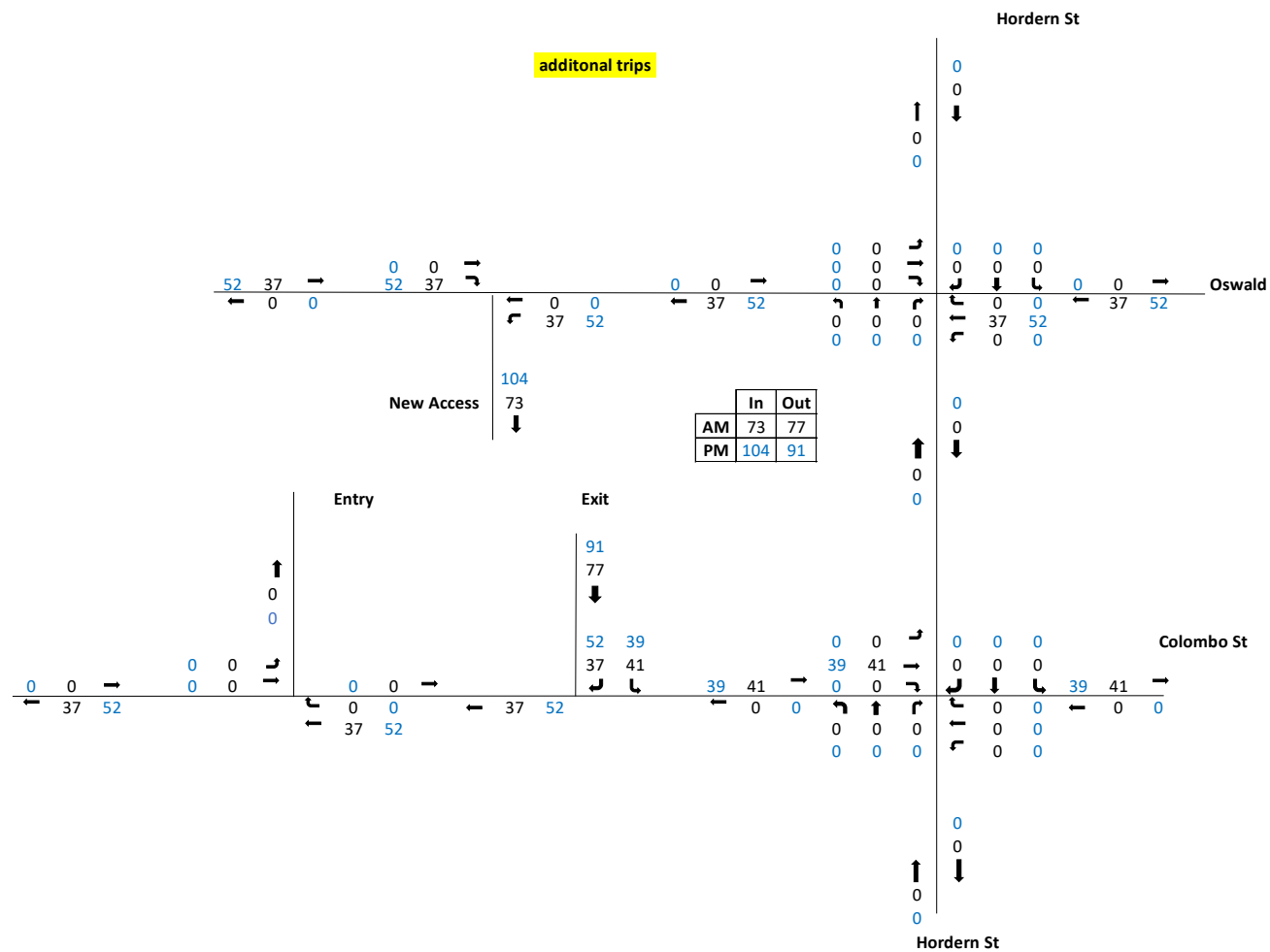


Figure 4: Maximum additional trips during the peak hours (AM/ PM)

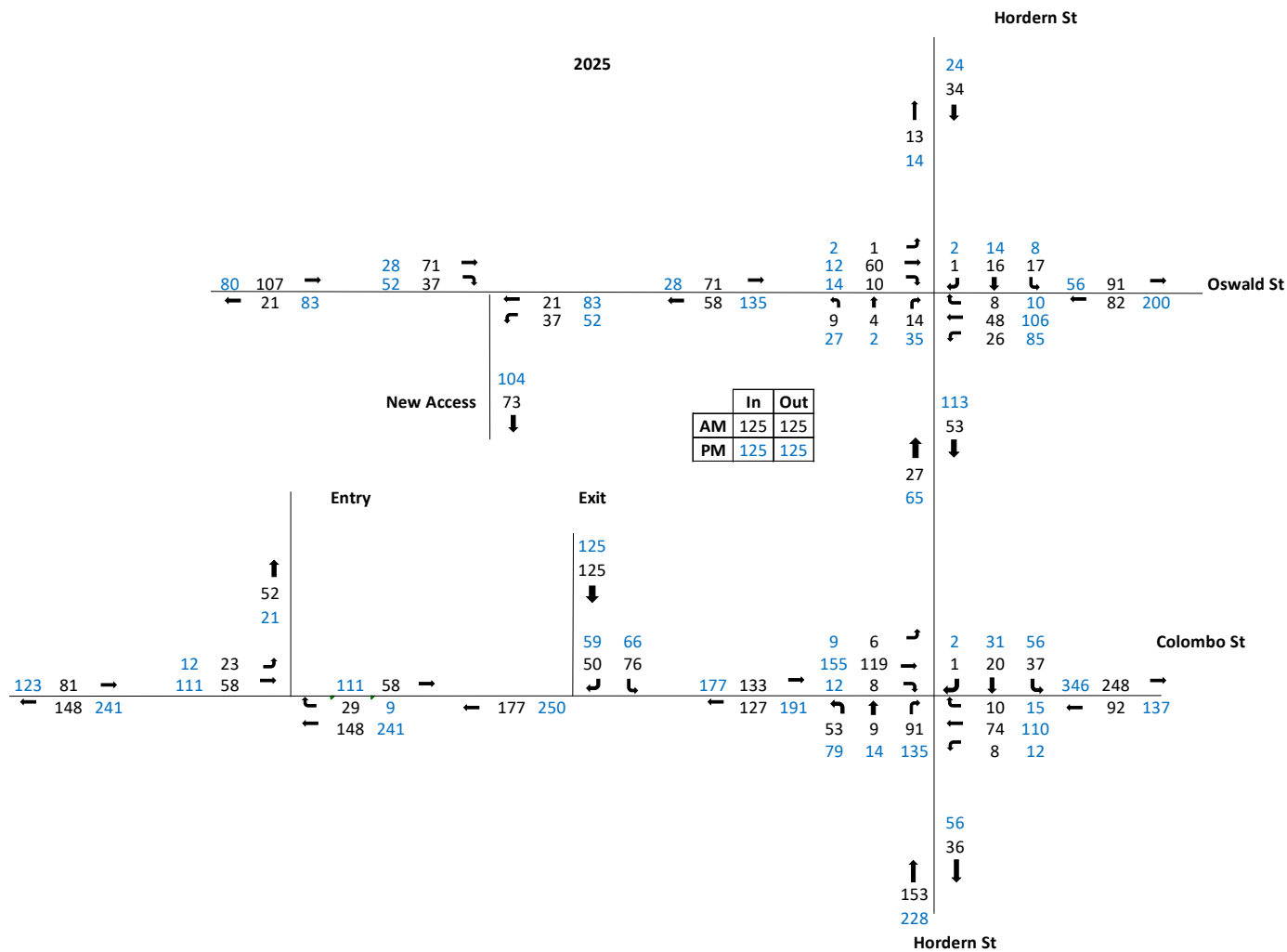


Figure 5: 2025 peak hours traffic (AM/ PM)

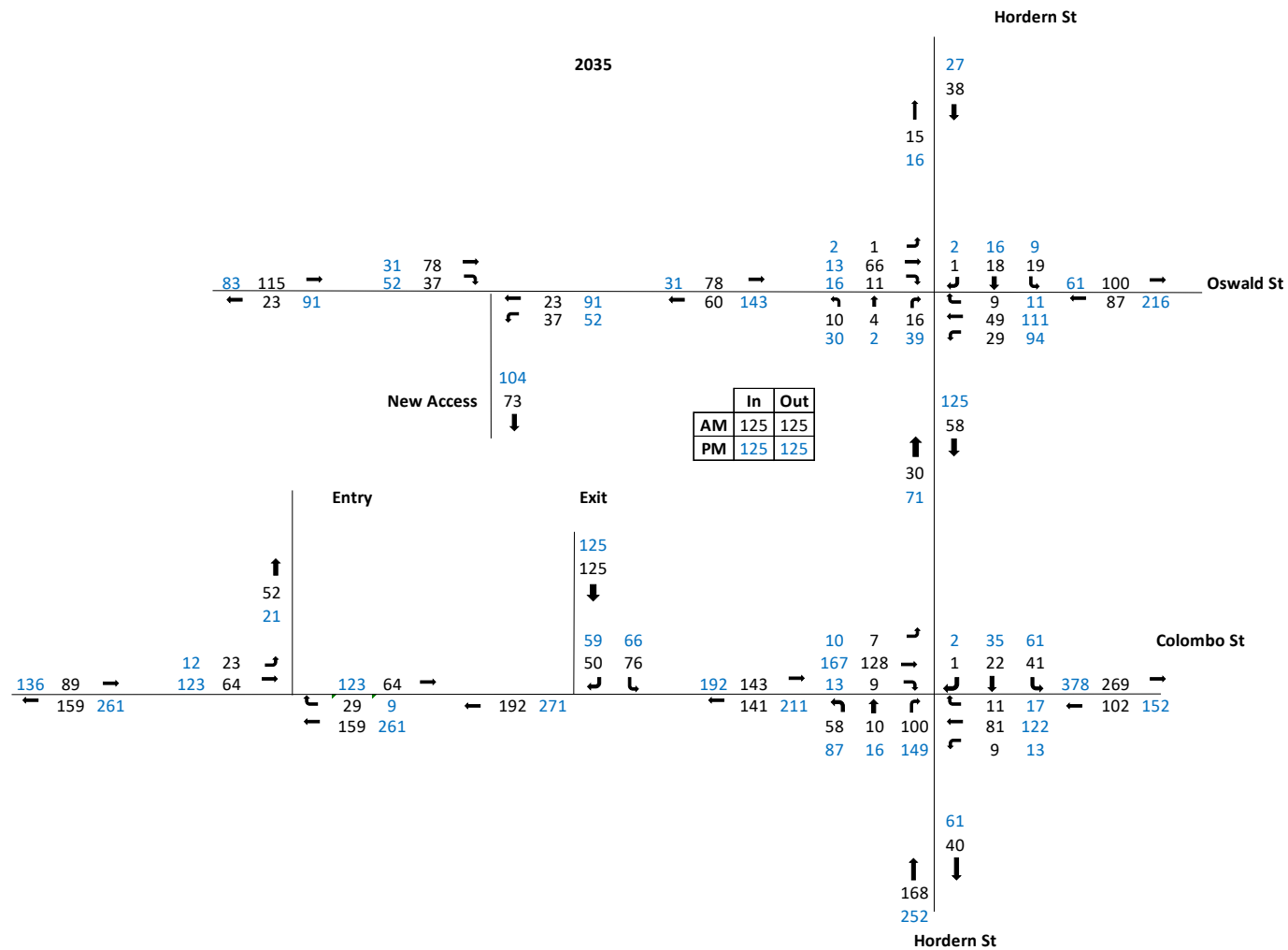


Figure 6: 2035 peak hours traffic (AM/ PM)

9. INTERSECTION ASSESSMENTS

The traffic operation of the existing roundabout intersection of Oswald Street/Hordern Street and the proposed entry crossover on Oswald Street has been assessed for 2025 and 2035 AM and PM peak hours as a network. The SIDRA network layout and SIDRA results are presented in **Appendix B**.

The SIDRA network assessments undertaken indicate that both the proposed roundabout and the crossover would operate satisfactorily during the peak hours, with Level of Service (LoS) A for all approaches. The analysis does not report any queue back from the roundabout to the entry crossover. Similarly, no queue back from the crossover to the roundabout intersection is reported.

10. UPDATED CRASH ASSESSMENT

Information available on the Main Roads WA website indicates the following crashes were recorded at the two intersections in the vicinity of the subject site during the five-year period ending December 2023.

- Hordern Street (West)/Colombo Street (North) Intersection:
 - 2 crashes total
 - 2 PDO major
 - 2 right angle crashes
- Oswald St – Hordern St intersection:
 - 3 crash total
 - 1 Hospital
 - 1 PDO minor
 - 1 PDO major
 - 1 rear end crash
 - 1 right angle crash
 - 1 other/ unknown

Overall, the number of crashes occurring near the Site is low and has not changed significantly from the five-year period between January 2018 and December 2022 as reported in Stantec TIA.

11. PEDESTRIAN SAFETY

The Town has raised a concern that pedestrian access and safety on Oswald Street may be impacted by the location of the proposed crossover for the kiss and ride activities. However, it should be noted that the proposed crossover is a 4.2m entry-only crossover situated on a straight section of Oswald Street.

There will be minimal traffic conflict at the proposed crossover, as it serves a one-way access with minimal movements during the morning and afternoon peak

hours. Additionally, the operating speed of the vehicles entering the access way would be very low, which would not undermine the safety of pedestrians on Oswald Street. The operating speed along Oswald Street is also limited to the school zone speed of 40 km/h, further enhancing the safety for pedestrians and vehicles.

Given the low traffic volume, the straight section of the road, and the slow vehicle speeds at the crossover, the design and location of the proposed crossover is not expected to pose a significant safety risk to pedestrians on Oswald Street.

In order to improve safety of the proposed entry crossover and the associated parking aisle, it is recommended that the school assign staff to monitor the crossover for student safety and the kiss and ride area during mornings and afternoons to guide the traffic and ensure that parents are not parking for long periods on these bays.

12. UPDATED SWEPT PATHS FOR B99 PASSENGER CARS

The swept paths for B99 vehicles accessing and egressing the proposed new parking bays are presented in **Appendix C** which confirm satisfactory traffic operations.

Extra space is provided in front of bay 32 (first kiss and ride bay) to ensure the B99 vehicle parking on this bay can exit the bay without impacting the existing verandah. The area behind Bay 37 (last kiss and ride bay) would be painted to allow for B99 vehicles to park in forward gear.

13. CONCLUSIONS

The proposal is to amend the existing development approval (5.2020.704.1) that was initially approved by the Town on July 20, 2021. The proposed amendment is to increase the capacity of the Victoria Park Christian School from the currently limited 150 students to 250 students.

Transcore conducted manual traffic counts at the school crossovers on Colombo Street on Thursday, June 6, 2024. The trip generation of the proposed school expansion has been calculated based on the Western Australian Planning Commission (WAPC) trip rates. Accordingly, a trip rate of 1 vehicle/hour per student (0.5 inbound and 0.5 outbound trips) has been applied to the additional 100 students, resulting in 50 vph inbound and 50 vph outbound trips during the peak hours.

The proposed development provides a total of 38 bays, excluding the 11 stacking bays along the proposed one-way aisle and the 3 on-street bays on Oswald Street, which satisfies the estimated actual parking demand of the proposed

school. Further only 77% of the student population (192 students) will generate parking demand due to usage of the private school bus service.

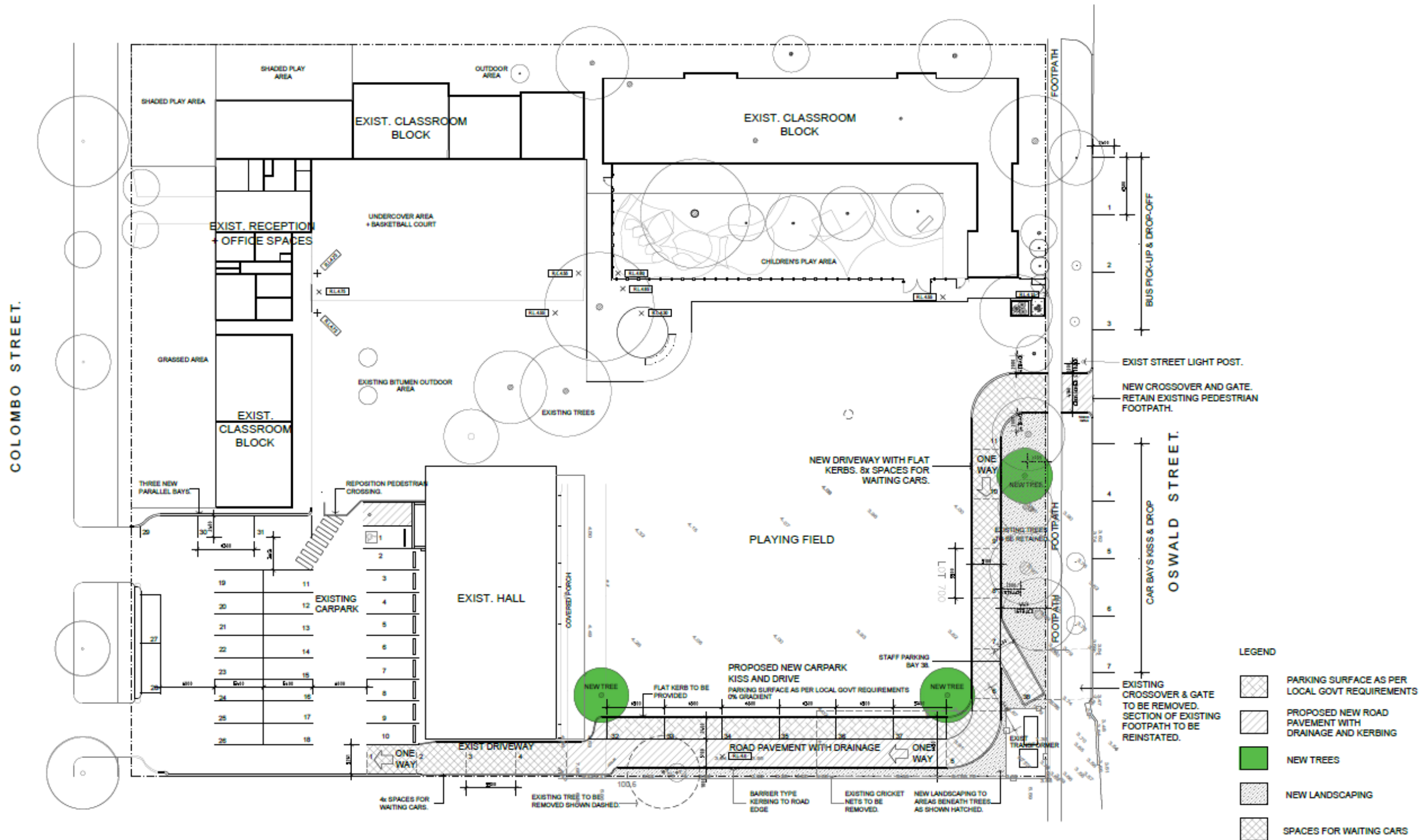
The SIDRA network assessments indicate that both the existing roundabout intersection of Oswald Street/Hordern Street and the proposed entry crossover would operate satisfactorily during the peak hours, with Level of Service (LoS) A for all approaches. The analysis does not report any queue back from the roundabout to the entry crossover, nor from the crossover to the roundabout intersection.

To improve the safety of the proposed entry crossover and the associated parking aisle, it is recommended that the school assign staff to monitor the crossover for student safety and the kiss-and-ride area during mornings and afternoons to guide the traffic and ensure that parents are not parking for long periods on these bays.

The swept paths for B99 vehicles accessing and egressing the proposed new parking bays are presented in Appendix C, confirming satisfactory traffic operations.

Appendix A

PROPOSED NEW CARPARK

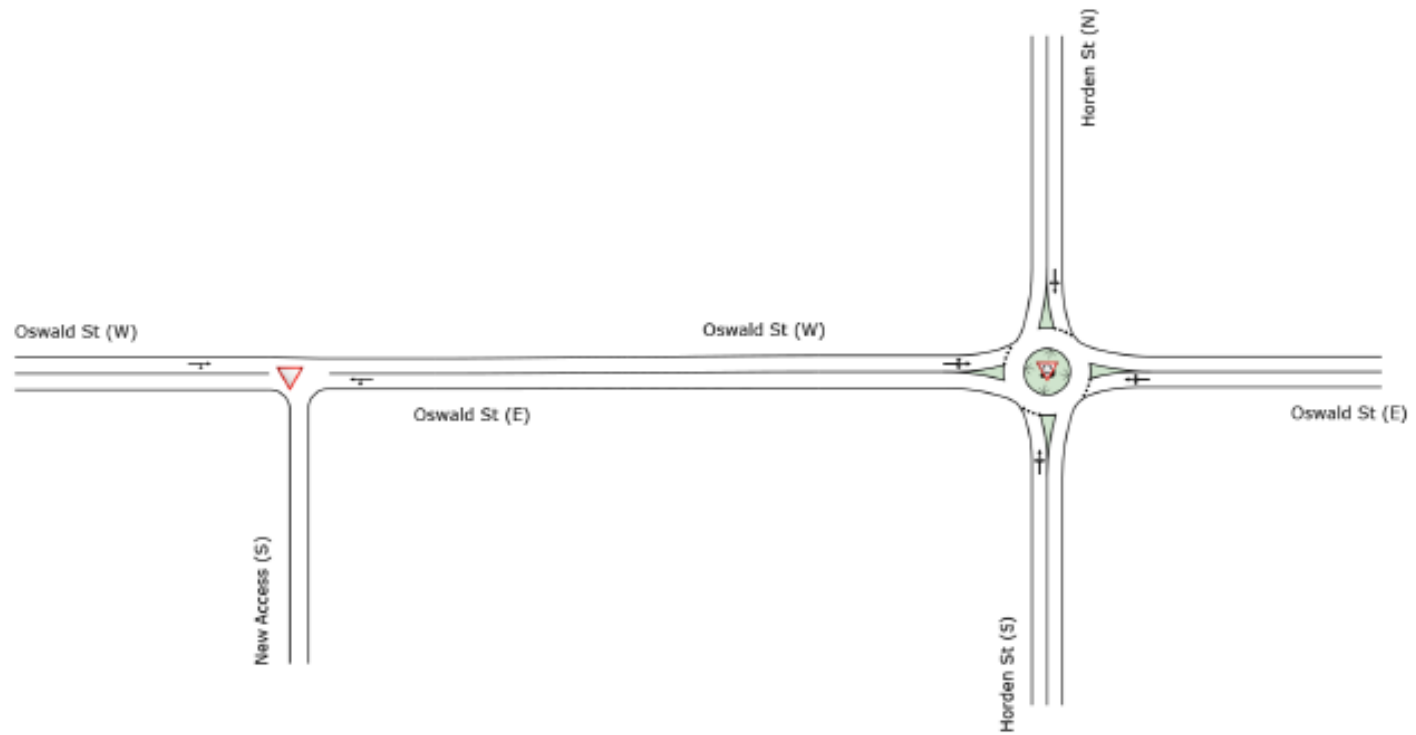


VICTORIA PARK CHRISTIAN SCHOOL COLOMBO ST VICTORIA PARK
PROPOSED NEW CARPARK
 14 JUNE 2024 | SCALE 1:400 @ A3



Appendix B

SIDRA RESULTS



MOVEMENT SUMMARY

 Site: [Horden St & Oswald St - Existing - AM (Site Folder: Existing)]

Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Horden St (S)														
10	L2	9	2.0	9	2.0	0.023	2.7	LOS A	0.1	0.9	0.12	0.47	0.12	22.6
11	T1	4	2.0	4	2.0	0.023	2.4	LOS A	0.1	0.9	0.12	0.47	0.12	38.6
12	R2	14	2.0	15	2.0	0.023	5.6	LOS A	0.1	0.9	0.12	0.47	0.12	38.6
Approach		27	2.0	28	2.0	0.023	4.2	LOS A	0.1	0.9	0.12	0.47	0.12	33.5
East: Oswald St (E)														
1	L2	26	2.0	27	2.0	0.038	2.8	LOS A	0.2	1.6	0.14	0.41	0.14	38.5
2	T1	11	2.0	12	2.0	0.038	2.5	LOS A	0.2	1.6	0.14	0.41	0.14	23.9
3	R2	8	2.0	8	2.0	0.038	5.6	LOS A	0.2	1.6	0.14	0.41	0.14	39.0
Approach		45	2.0	47	2.0	0.038	3.2	LOS A	0.2	1.6	0.14	0.41	0.14	35.3
North: Horden St (N)														
4	L2	17	2.0	18	2.0	0.031	3.2	LOS A	0.2	1.3	0.26	0.38	0.26	38.4
5	T1	16	2.0	17	2.0	0.031	2.9	LOS A	0.2	1.3	0.26	0.38	0.26	39.0
6	R2	1	2.0	1	2.0	0.031	6.0	LOS A	0.2	1.3	0.26	0.38	0.26	22.8
Approach		34	2.0	36	2.0	0.031	3.1	LOS A	0.2	1.3	0.26	0.38	0.26	38.3
West: Oswald St (W)														
7	L2	1	2.0	1	2.0	0.057	2.5	LOS A	0.3	2.3	0.13	0.36	0.13	37.7
8	T1	59	2.0	62	2.0	0.057	2.2	LOS A	0.3	2.3	0.13	0.36	0.13	38.6
9	R2	10	2.0	11	2.0	0.057	5.3	LOS A	0.3	2.3	0.13	0.36	0.13	38.5
Approach		70	2.0	74	2.0	0.057	2.7	LOS A	0.3	2.3	0.13	0.36	0.13	38.5
All Vehicles		176	2.0	185	2.0	0.057	3.1	LOS A	0.3	2.3	0.16	0.39	0.16	36.5

MOVEMENT SUMMARY

 Site: [Horden St & Oswald St - Existing - PM (Site Folder: Existing)]

Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Horden St (S)														
10	L2	27	2.0	28	2.0	0.058	3.1	LOS A	0.3	2.4	0.24	0.49	0.24	22.5
11	T1	2	2.0	2	2.0	0.058	2.8	LOS A	0.3	2.4	0.24	0.49	0.24	38.4
12	R2	35	2.0	37	2.0	0.058	5.9	LOS A	0.3	2.4	0.24	0.49	0.24	38.4
Approach		64	2.0	67	2.0	0.058	4.6	LOS A	0.3	2.4	0.24	0.49	0.24	31.9
East: Oswald St (E)														
1	L2	84	2.0	88	2.0	0.116	2.8	LOS A	0.7	5.1	0.15	0.38	0.15	38.6
2	T1	53	2.0	56	2.0	0.116	2.5	LOS A	0.7	5.1	0.15	0.38	0.15	23.9
3	R2	10	2.0	11	2.0	0.116	5.6	LOS A	0.7	5.1	0.15	0.38	0.15	39.1
Approach		147	2.0	155	2.0	0.116	2.9	LOS A	0.7	5.1	0.15	0.38	0.15	33.7
North: Horden St (N)														
4	L2	8	2.0	8	2.0	0.022	3.0	LOS A	0.1	0.9	0.22	0.37	0.22	38.5
5	T1	14	2.0	15	2.0	0.022	2.7	LOS A	0.1	0.9	0.22	0.37	0.22	39.0
6	R2	2	2.0	2	2.0	0.022	5.9	LOS A	0.1	0.9	0.22	0.37	0.22	22.9
Approach		24	2.0	25	2.0	0.022	3.1	LOS A	0.1	0.9	0.22	0.37	0.22	37.5
West: Oswald St (W)														
7	L2	2	2.0	2	2.0	0.025	2.7	LOS A	0.1	1.0	0.19	0.45	0.19	36.8
8	T1	12	2.0	13	2.0	0.025	2.4	LOS A	0.1	1.0	0.19	0.45	0.19	37.7
9	R2	14	2.0	15	2.0	0.025	5.5	LOS A	0.1	1.0	0.19	0.45	0.19	37.6
Approach		28	2.0	29	2.0	0.025	4.0	LOS A	0.1	1.0	0.19	0.45	0.19	37.6
All Vehicles		263	2.0	277	2.0	0.116	3.4	LOS A	0.7	5.1	0.19	0.41	0.19	33.9

MOVEMENT SUMMARY

Site: [Horden St & Oswald St - 2025 - AM (Site Folder: 2025)]

Network: N101 [AM
(Network Folder: 2025)]

Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total HV veh/h	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Horden St (S)														
10	L2	9	2.0	9	2.0	0.024	3.0	LOS A	0.1	1.0	0.22	0.47	0.22	36.3
11	T1	4	2.0	4	2.0	0.024	2.7	LOS A	0.1	1.0	0.22	0.47	0.22	38.5
12	R2	15	2.0	15	2.0	0.024	5.8	LOS A	0.1	1.0	0.22	0.47	0.22	38.5
Approach		28	2.0	28	2.0	0.024	4.4	LOS A	0.1	1.0	0.22	0.47	0.22	38.0
East: Oswald St (E)														
1	L2	27	2.0	27	2.0	0.066	2.8	LOS A	0.4	2.8	0.14	0.37	0.14	38.6
2	T1	51	2.0	51	2.0	0.066	2.5	LOS A	0.4	2.8	0.14	0.37	0.14	37.4
3	R2	8	2.0	8	2.0	0.066	5.6	LOS A	0.4	2.8	0.14	0.37	0.14	39.1
Approach		86	2.0	86	2.0	0.066	2.9	LOS A	0.4	2.8	0.14	0.37	0.14	38.1
North: Horden St (N)														
4	L2	18	2.0	18	2.0	0.031	3.2	LOS A	0.2	1.3	0.27	0.38	0.27	38.4
5	T1	17	2.0	17	2.0	0.031	2.9	LOS A	0.2	1.3	0.27	0.38	0.27	39.0
6	R2	1	2.0	1	2.0	0.031	6.0	LOS A	0.2	1.3	0.27	0.38	0.27	37.1
Approach		36	2.0	36	2.0	0.031	3.1	LOS A	0.2	1.3	0.27	0.38	0.27	38.7
West: Oswald St (W)														
7	L2	1	2.0	1	2.0	0.058	2.5	LOS A	0.3	2.3	0.13	0.35	0.13	37.7
8	T1	63	2.0	63	2.0	0.058	2.2	LOS A	0.3	2.3	0.13	0.35	0.13	38.6
9	R2	11	2.0	11	2.0	0.058	5.3	LOS A	0.3	2.3	0.13	0.35	0.13	38.5
Approach		75	2.0	75	2.0	0.058	2.7	LOS A	0.3	2.3	0.13	0.35	0.13	38.5
All Vehicles		225	2.0	225	2.0	0.066	3.0	LOS A	0.4	2.8	0.17	0.38	0.17	38.3

MOVEMENT SUMMARY

Site: [New Access & Oswald St - 2025 - AM (Site Folder: 2025)]

Network: N101 [AM
(Network Folder: 2025)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
East: Oswald St (E)														
1	L2	39	2.0	39	2.0	0.033	3.2	LOS A	0.0	0.0	0.00	0.29	0.00	30.0
2	T1	22	2.0	22	2.0	0.033	0.0	LOS A	0.0	0.0	0.00	0.29	0.00	38.4
Approach		61	2.0	61	2.0	0.033	2.0	NA	0.0	0.0	0.00	0.29	0.00	35.9
West: Oswald St (W)														
8	T1	75	2.0	75	2.0	0.063	0.1	LOS A	0.2	1.6	0.11	0.17	0.11	38.6
9	R2	39	2.0	39	2.0	0.063	3.9	LOS A	0.2	1.6	0.11	0.17	0.11	36.8
Approach		114	2.0	114	2.0	0.063	1.4	NA	0.2	1.6	0.11	0.17	0.11	37.9
All Vehicles		175	2.0	175	2.0	0.063	1.6	NA	0.2	1.6	0.07	0.22	0.07	37.5

MOVEMENT SUMMARY

Site: [Horden St & Oswald St - 2025 - PM (Site Folder: 2025)] Network: N101 [PM (Network Folder: 2025)]

Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Horden St (S)														
10	L2	28	2.0	28	2.0	0.061	3.4	LOS A	0.3	2.5	0.33	0.51	0.33	35.9
11	T1	2	2.0	2	2.0	0.061	3.1	LOS A	0.3	2.5	0.33	0.51	0.33	38.3
12	R2	37	2.0	37	2.0	0.061	6.3	LOS A	0.3	2.5	0.33	0.51	0.33	38.3
Approach		67	2.0	67	2.0	0.061	5.0	LOS A	0.3	2.5	0.33	0.51	0.33	37.6
East: Oswald St (E)														
1	L2	89	2.0	89	2.0	0.155	2.8	LOS A	0.9	7.1	0.16	0.36	0.16	38.6
2	T1	112	2.0	112	2.0	0.155	2.5	LOS A	0.9	7.1	0.16	0.36	0.16	37.4
3	R2	11	2.0	11	2.0	0.155	5.6	LOS A	0.9	7.1	0.16	0.36	0.16	39.1
Approach		212	2.0	212	2.0	0.155	2.8	LOS A	0.9	7.1	0.16	0.36	0.16	38.2
North: Horden St (N)														
4	L2	8	2.0	8	2.0	0.022	3.0	LOS A	0.1	0.9	0.23	0.37	0.23	38.5
5	T1	15	2.0	15	2.0	0.022	2.7	LOS A	0.1	0.9	0.23	0.37	0.23	39.0
6	R2	2	2.0	2	2.0	0.022	5.9	LOS A	0.1	0.9	0.23	0.37	0.23	37.1
Approach		25	2.0	25	2.0	0.022	3.1	LOS A	0.1	0.9	0.23	0.37	0.23	38.7
West: Oswald St (W)														
7	L2	2	2.0	2	2.0	0.025	2.7	LOS A	0.1	1.0	0.19	0.45	0.19	36.8
8	T1	13	2.0	13	2.0	0.025	2.4	LOS A	0.1	1.0	0.19	0.45	0.19	37.7
9	R2	15	2.0	15	2.0	0.025	5.5	LOS A	0.1	1.0	0.19	0.45	0.19	37.6
Approach		29	2.0	29	2.0	0.025	4.0	LOS A	0.1	1.0	0.19	0.45	0.19	37.6
All Vehicles		334	2.0	334	2.0	0.155	3.3	LOS A	0.9	7.1	0.20	0.40	0.20	38.1

MOVEMENT SUMMARY

Site: [New Access & Oswald St - 2025 - PM (Site Folder: 2025)] Network: N101 [PM (Network Folder: 2025)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total HV] veh/h	%	v/c	sec		[Veh. veh	Dist] m				km/h
East: Oswald St (E)														
1	L2	55	2.0	55	2.0	0.077	3.2	LOS A	0.0	0.0	0.00	0.18	0.00	32.0
2	T1	87	2.0	87	2.0	0.077	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	39.0
Approach		142	2.0	142	2.0	0.077	1.2	NA	0.0	0.0	0.00	0.18	0.00	38.1
West: Oswald St (W)														
8	T1	29	2.0	29	2.0	0.051	0.4	LOS A	0.2	1.8	0.25	0.33	0.25	37.3
9	R2	55	2.0	55	2.0	0.051	4.2	LOS A	0.2	1.8	0.25	0.33	0.25	35.7
Approach		84	2.0	84	2.0	0.051	2.8	NA	0.2	1.8	0.25	0.33	0.25	36.2
All Vehicles		226	2.0	226	2.0	0.077	1.8	NA	0.2	1.8	0.09	0.24	0.09	37.2

MOVEMENT SUMMARY

Site: [Horden St & Oswald St - 2035 - AM (Site Folder: 2035)]

Network: N101 [AM
(Network Folder: 2035)]

Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total HV] veh/h	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Horden St (S)														
10	L2	11	2.0	11	2.0	0.027	3.0	LOS A	0.1	1.1	0.22	0.48	0.22	36.3
11	T1	4	2.0	4	2.0	0.027	2.7	LOS A	0.1	1.1	0.22	0.48	0.22	38.5
12	R2	17	2.0	17	2.0	0.027	5.8	LOS A	0.1	1.1	0.22	0.48	0.22	38.5
Approach		32	2.0	32	2.0	0.027	4.5	LOS A	0.1	1.1	0.22	0.48	0.22	38.0
East: Oswald St (E)														
1	L2	31	2.0	31	2.0	0.071	2.8	LOS A	0.4	3.0	0.15	0.37	0.15	38.6
2	T1	52	2.0	52	2.0	0.071	2.5	LOS A	0.4	3.0	0.15	0.37	0.15	37.3
3	R2	9	2.0	9	2.0	0.071	5.6	LOS A	0.4	3.0	0.15	0.37	0.15	39.1
Approach		92	2.0	92	2.0	0.071	2.9	LOS A	0.4	3.0	0.15	0.37	0.15	38.1
North: Horden St (N)														
4	L2	20	2.0	20	2.0	0.035	3.2	LOS A	0.2	1.4	0.28	0.39	0.28	38.4
5	T1	19	2.0	19	2.0	0.035	2.9	LOS A	0.2	1.4	0.28	0.39	0.28	38.9
6	R2	1	2.0	1	2.0	0.035	6.1	LOS A	0.2	1.4	0.28	0.39	0.28	37.0
Approach		40	2.0	40	2.0	0.035	3.2	LOS A	0.2	1.4	0.28	0.39	0.28	38.6
West: Oswald St (W)														
7	L2	1	2.0	1	2.0	0.064	2.5	LOS A	0.3	2.6	0.14	0.36	0.14	37.6
8	T1	69	2.0	69	2.0	0.064	2.3	LOS A	0.3	2.6	0.14	0.36	0.14	38.5
9	R2	12	2.0	12	2.0	0.064	5.4	LOS A	0.3	2.6	0.14	0.36	0.14	38.5
Approach		82	2.0	82	2.0	0.064	2.7	LOS A	0.3	2.6	0.14	0.36	0.14	38.5
All Vehicles		245	2.0	245	2.0	0.071	3.1	LOS A	0.4	3.0	0.18	0.38	0.18	38.3

MOVEMENT SUMMARY

Site: [New Access & Oswald St - 2035 - AM (Site Folder: 2035)]

Network: N101 [AM
(Network Folder: 2035)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total HV] veh/h	%	v/c	sec		[Veh. veh	Dist] m				km/h
East: Oswald St (E)														
1	L2	39	2.0	39	2.0	0.034	3.2	LOS A	0.0	0.0	0.00	0.29	0.00	30.2
2	T1	24	2.0	24	2.0	0.034	0.0	LOS A	0.0	0.0	0.00	0.29	0.00	38.5
Approach		63	2.0	63	2.0	0.034	2.0	NA	0.0	0.0	0.00	0.29	0.00	36.2
West: Oswald St (W)														
8	T1	82	2.0	82	2.0	0.067	0.1	LOS A	0.2	1.6	0.10	0.16	0.10	38.7
9	R2	39	2.0	39	2.0	0.067	3.9	LOS A	0.2	1.6	0.10	0.16	0.10	36.8
Approach		121	2.0	121	2.0	0.067	1.3	NA	0.2	1.6	0.10	0.16	0.10	38.0
All Vehicles		184	2.0	184	2.0	0.067	1.5	NA	0.2	1.6	0.07	0.21	0.07	37.6

MOVEMENT SUMMARY

Site: [Horden St & Oswald St - 2035 - PM (Site Folder: 2035)] Network: N101 [PM (Network Folder: 2035)]

Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Horden St (S)														
10	L2	32	2.0	32	2.0	0.069	3.5	LOS A	0.4	2.9	0.34	0.51	0.34	35.9
11	T1	2	2.0	2	2.0	0.069	3.2	LOS A	0.4	2.9	0.34	0.51	0.34	38.3
12	R2	41	2.0	41	2.0	0.069	6.3	LOS A	0.4	2.9	0.34	0.51	0.34	38.3
Approach		75	2.0	75	2.0	0.069	5.0	LOS A	0.4	2.9	0.34	0.51	0.34	37.6
East: Oswald St (E)														
1	L2	99	2.0	99	2.0	0.168	2.8	LOS A	1.0	7.8	0.17	0.37	0.17	38.6
2	T1	117	2.0	117	2.0	0.168	2.5	LOS A	1.0	7.8	0.17	0.37	0.17	37.3
3	R2	12	2.0	12	2.0	0.168	5.7	LOS A	1.0	7.8	0.17	0.37	0.17	39.1
Approach		227	2.0	227	2.0	0.168	2.8	LOS A	1.0	7.8	0.17	0.37	0.17	38.2
North: Horden St (N)														
4	L2	9	2.0	9	2.0	0.024	3.1	LOS A	0.1	1.0	0.24	0.37	0.24	38.4
5	T1	17	2.0	17	2.0	0.024	2.7	LOS A	0.1	1.0	0.24	0.37	0.24	39.0
6	R2	2	2.0	2	2.0	0.024	5.9	LOS A	0.1	1.0	0.24	0.37	0.24	37.1
Approach		28	2.0	28	2.0	0.024	3.1	LOS A	0.1	1.0	0.24	0.37	0.24	38.7
West: Oswald St (W)														
7	L2	2	2.0	2	2.0	0.027	2.7	LOS A	0.1	1.1	0.20	0.46	0.20	36.7
8	T1	14	2.0	14	2.0	0.027	2.4	LOS A	0.1	1.1	0.20	0.46	0.20	37.6
9	R2	17	2.0	17	2.0	0.027	5.5	LOS A	0.1	1.1	0.20	0.46	0.20	37.6
Approach		33	2.0	33	2.0	0.027	4.0	LOS A	0.1	1.1	0.20	0.46	0.20	37.5
All Vehicles		363	2.0	363	2.0	0.168	3.4	LOS A	1.0	7.8	0.22	0.41	0.22	38.1

MOVEMENT SUMMARY

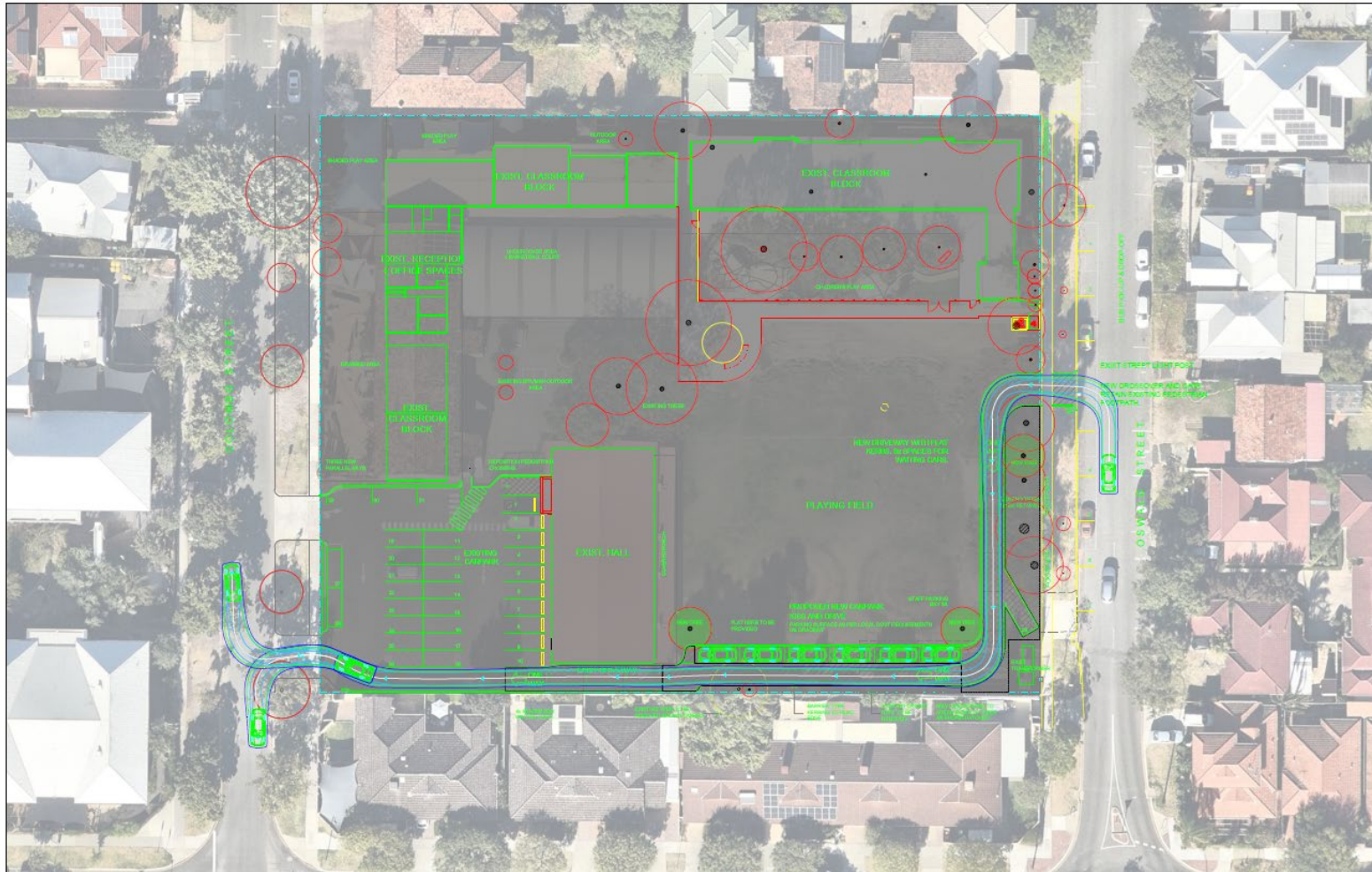
Site: [New Access & Oswald St - 2035 - PM (Site Folder: 2035)] Network: N101 [PM (Network Folder: 2035)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total HV] veh/h	%	v/c	sec		[Veh. veh	Dist] m				km/h
East: Oswald St (E)														
1	L2	55	2.0	55	2.0	0.081	3.2	LOS A	0.0	0.0	0.00	0.17	0.00	32.2
2	T1	96	2.0	96	2.0	0.081	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	39.1
Approach		151	2.0	151	2.0	0.081	1.2	NA	0.0	0.0	0.00	0.17	0.00	38.3
West: Oswald St (W)														
8	T1	33	2.0	33	2.0	0.053	0.4	LOS A	0.2	1.9	0.25	0.32	0.25	37.4
9	R2	55	2.0	55	2.0	0.053	4.2	LOS A	0.2	1.9	0.25	0.32	0.25	35.7
Approach		87	2.0	87	2.0	0.053	2.8	NA	0.2	1.9	0.25	0.32	0.25	36.3
All Vehicles		238	2.0	238	2.0	0.081	1.8	NA	0.2	1.9	0.09	0.22	0.09	37.4

Appendix C

TURN PATHS



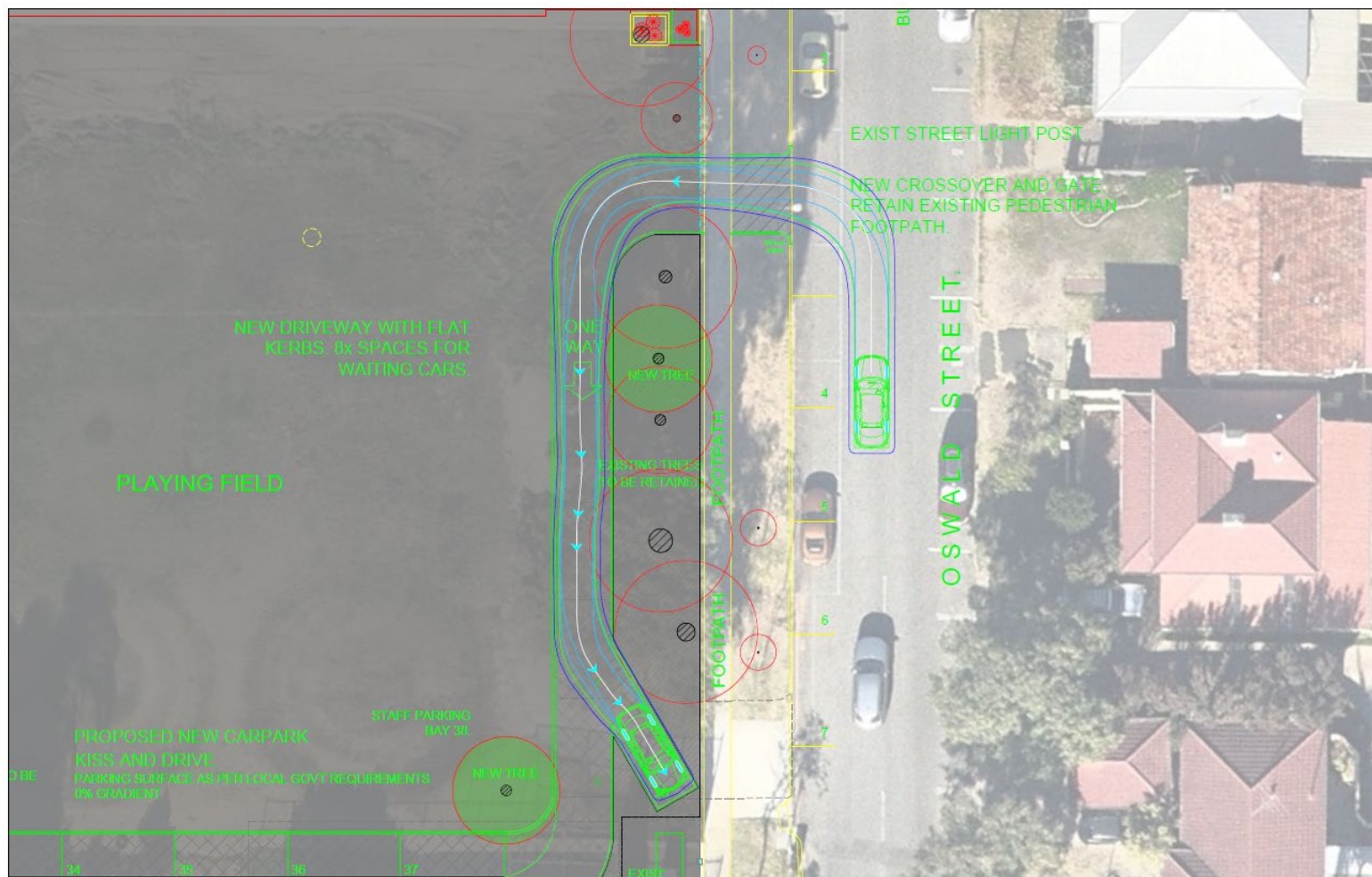
32 Oswald Street, Victoria Park
 Austrorads 2013: B99 Passenger Car
 New Driveway Entry and Exit

LEGEND
 Vehicle Body
 Wheel Path
 300mm Clearance



t24.134.sk10
 19/06/2024
 Scale: 1:500 @ A3





32 Oswald Street, Victoria Park
Austroads 2013: B99 Passenger Car
Staff Bay Entry

LEGEND
Vehicle Body
Wheel Path
300mm Clearance



t24.134.sk07
19/06/2024
Scale: 1:200 @ A3



